

### **ABSTRACT OF THE INVENTION**

A detector oligonucleotide comprises multiple pairs of a donor fluorophore and a quencher molecule, which donor fluorophores and quencher molecules are separated by a site that is capable of being cleaved when in double-stranded form. The detector oligonucleotide may be made double-stranded in a manner that depends on the presence of a target nucleic acid, allowing the cleavage sites to be cleaved. Separation of the donor fluorophores and the quencher molecules decreases fluorescence quenching and generates a detectable change in a fluorescence parameter of the fluorophores of the detector oligonucleotide. By using multiple donor/quencher pairs, the present detector oligonucleotide advantageously generates a high signal to noise ratio and high efficiency in detection of a target nucleic acid.